

CLAIMS

What is claimed is:

1. A method of communicating between a burst manager and plural remote terminals over a first passive optical network (PON) and a second PON, each PON having a downstream portion and an upstream portion, the method comprising:
- transmitting a common synchronization signal from the burst manager to the plural remote terminals over both downstream PON portions;
- transmitting burst data from the plural remote terminals over both upstream PON portions to the burst manager, the burst data for each remote terminal being delayed on the first PON by a corresponding first delay and being delayed on the second PON by a corresponding second delay, the first delay comprising a first ranging delay and the second delay comprising a second ranging delay wherein the first and second ranging delays for each remote terminal are adjusted with respect to the common synchronization signal such that the burst data for any particular remote terminal transmitted on the first PON arrives at the burst manager simultaneously with the burst data for that particular remote terminal transmitted on the second PON.
2. The method of Claim 1 wherein transmitting the common synchronization signal from the burst manager includes transmitting the common synchronization signal in a downstream TDM signal over both downstream PON portions.
3. The method of Claim 1 wherein transmitting burst data includes transmitting burst data in TDMA timeslots such that corresponding timeslots on both PONs for each remote terminal are received at the burst manager aligned and in the same relative timeslot position and further comprising examining data received

in the corresponding timeslots on both PONs at the burst manager to determine which timeslots contain valid data and selecting valid data on a per timeslot basis.

4. The method of Claim 1 wherein the first and second PONs are configured as counter-rotating quasi-rings.
5. The method of Claim 1 wherein the first and second PONs are configured as uni-directional quasi-rings.
6. A communication system comprising:
- 10 a first passive optical network (PON) having a downstream portion and an upstream portion;
 - a second passive optical network (PON) having a downstream portion and an upstream portion;
 - 15 a burst manager coupled to the first and second PONs, the burst manager transmitting a common synchronization signal over both downstream PON portions; and
 - a plurality of remote terminals coupled to the first and second PONs for communicating with the burst manager, each remote terminal transmitting burst data over both upstream PON portions to the burst manager, the burst data for each remote terminal being delayed on the first PON by a corresponding first delay and being delayed on the second PON by a corresponding second delay, the first delay comprising a first ranging delay and the second delay comprising a second ranging delay wherein the first and second ranging delays for each remote terminal are adjusted with respect to the common synchronization signal such that the burst data for any particular remote terminal transmitted on the first PON arrives at the burst manager simultaneously with the burst data for that particular remote terminal transmitted on the second PON.
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7. The system of Claim 6 wherein the burst manager transmits the common synchronization signal in a downstream TDM signal over both downstream PON portions.
- 5 8. The system of Claim 6 wherein the remote terminals transmit burst data in TDMA timeslots and the first and second ranging delays include a corresponding timeslot offset such that corresponding timeslots on both PONs for each remote terminal are received at the burst manager aligned and in the same relative timeslot position and wherein the burst manager examines data
10 received in the corresponding timeslots on both PONs to determine which timeslots contain valid data and selects valid data on a per timeslot basis.
9. The system of Claim 6 wherein the first and second PONs are configured as counter-rotating quasi-rings.
10. The system of Claim 6 wherein the first and second PONs are configured as uni-
15 directional quasi-rings.

Approved for Release